



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

: **Mail Stop: ISSUE FEE**

Mitsuo TADA et al.

: Confirmation No. 7118

Serial No. 09/982,025

: Docket No. 2001-1568A

Filed October 19, 2001

: Group Art Unit 2862

FREQUENCY MEASURING DEVICE, POLISHING DEVICE USING THE SAME AND EDDY CURRENT SENSOR

: Examiner Jay M. Patidar

**REQUEST FOR PLACEMENT OF FOREIGN
OFFICE ACTION IN APPLICATION FILE**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

THE COMMISSIONER IS AUTHORIZED
TO CHARGE ANY DEFICIENCY IN THE
FEES FOR THIS PAPER TO DEPOSIT
ACCOUNT NO. 23-0975

Sir:

Submitted herewith is a European Office Action issued for a European application corresponding to the above-identified application. References D1 (U.S. 3,909,714), D2 (Horowitz, "The Art of Electronics," 1980, Cambridge University Press, page 618) and D3 (U.S. 5,644,221) cited in the European Office Action were already made of record in the present application.

The Applicants respectfully request that the European Office Action be placed in the application file of the Office.

Respectfully submitted,

Mitsuo TADA et al.

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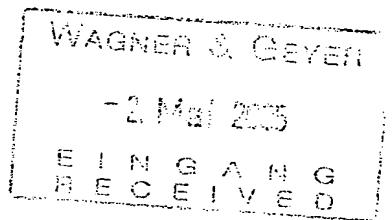
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Application No. 01 124 975.2 - 1524	Ref. Y-E-19115/764	Date 29.04.2005
Applicant EBARA CORPORATION		

Communication pursuant to Article 96(2) EPC

The examination of the above-identified application has revealed that it does not meet the requirements of the European Patent Convention for the reasons enclosed herewith. If the deficiencies indicated are not rectified the application may be refused pursuant to Article 97(1) EPC.

You are invited to file your observations and insofar as the deficiencies are such as to be rectifiable, to correct the indicated deficiencies within a period

of 4 months

from the notification of this communication, this period being computed in accordance with Rules 78(2) and 83(2) and (4) EPC.

One set of amendments to the description, claims and drawings is to be filed within the said period on separate sheets (Rule 36(1) EPC).

Failure to comply with this invitation in due time will result in the application being deemed to be withdrawn (Article 96(3) EPC).



Prasse, T
Primary Examiner
for the Examining Division

Enclosure(s): 5 page/s reasons (Form 2906)

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Bescheid/Protokoll (Anlage)	Communication/Minutes (Annex)	Notification/Procès-verbal (Annexe)
Datum Date Date 29.04.2005	Blatt Sheet Feuille 1	Anmelde-Nr.: Application No.: 01 124 975.2 Demande n°:

1. The examination is being carried out on the originally filed **documents**.
2. The following documents are referred to in this communication; the numbering will be adhered to in the rest of the procedure:
 - D1: US-A-3909714
 - D2: P. Horowitz, "the art of electronics", p. 618, Cambridge University Press (1980)
 - D3: US-A-5644221
3. The Examining Division agrees with the objection put forward by the Search Division as to **lack of unity (Article 82 EPC)**. The present application contains 3 inventions (first invention: claims 1-6, second invention: claims 7-11 and third invention: claims 12-18), the reasons for the objection being as follows:
 - 3.1 Although one might define a **single general concept** of the **first and second invention** in providing a device for measuring a frequency of a measured signal, this subject-matter is not new in view of the general knowledge of a person skilled in the art.
 - 3.2 There is **no single general concept** between the **first and the third invention**.
 - 3.3 One might define a **single general concept** between the **second and the third invention** as aiming to provide an eddy current sensor, said sensor comprising a sensor coil for generating an eddy current in said conductive film, this subject-matter is not new in view of document D3, see col. 2, lines 36-45 and Fig. 2.
 - 3.4 With respect to the **first invention**, claims 1-6, it appears that D3 does not describe a **plurality of n-nary counters** (see e.g. col. 3, lines 12-22). This feature could be seen to make a contribution over the prior art (**STF of the first invention** according to Rule 30(1) EPC). In view of D3, the objective problem to be solved by the first invention can be seen in how to provide an improved frequency resolution without increasing the measurement time.
 - 3.5 With respect to the **second invention**, claims 7-11, it appears that D3 does not describe an **integrally formation** of the sensor coil and the active element unit (see e.g. Fig. 2). This

See Rule 30(1): "Special technical features"



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feature could be seen to make a contribution over the prior art (**STF of the second invention** according to Rule 30(1) EPC). In view of D3, the objective problem to be solved by the second invention can be seen in how to reduce noise in the measured signal.

3.6 With respect to the **third invention**, claims 12-18, it appears that D3 does not describe the detection of a change in the thickness of a conductive film from the change of the **resistance component** in an impedance formed by the sensor coil and the conductive film (see e.g. col. 2, lines 36-45). This feature could be seen to make a contribution over the prior art (**STF of the third invention** according to Rule 30(1) EPC). In view of D3, the objective problem could be seen in how to improve the accuracy of a thickness measurement by means of eddy currents.

3.7 The above analysis shows that the **STF of the first invention is not the same** as the STF of the other two inventions and that the STF of the second and third invention are as well different. Furthermore, the STF of the first invention is directed to a frequency measurement system, while the STF of the second and third invention are directed to eddy current sensors. The STF of the second invention is related to an improvement of an eddy current sensor which uses the variable frequency as an indicator for the thickness of the conductive layer, while the STF of the third invention is related to the measurement of the resistance component in an eddy current sensor as an indicator of the thickness. This indicates that the STF of the three inventions do not have any **correspondence**.

3.8 A comparison of the **objective problems** of the inventions, all seen in the light of the description and the drawings of the present application, indicates that there is **no technical correspondence** between the objective problems. They also do not show any corresponding technical effect. On the contrary, the different subject-matter of the inventions appears to be independently applicable to solve the independent objective problems.

3.9 Since the applicant has not indicated on which invention searched by the Search Division the further prosecution of the application should be based, no further examination can be carried out for the time being (cf. the Guidelines, C-III, 7.10). The applicant is asked to state upon which invention **further prosecution** of this application should be based and to limit the



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application accordingly. Other inventions are to be excised from the claims, description and drawings if any.

The subject-matter to be excised may be made the subject of one or more **divisional applications**. The divisional applications must be filed directly at the European Patent Office in Munich or its branch at The Hague and in the language of the proceedings relating to the present application, cf. **Article 76(1) and Rule 4 EPC**.

4. The following objections are directed to the **first invention, claims 1-6**, as an indication about the patentability of the subject-matter of the first invention.

5. The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of **claim 1** does not involve an inventive step in the sense of **Article 56 EPC** in view of **D1**.

5.1 Document D1, which is considered to represent the most relevant state of the art, discloses a device for measuring a frequency of a measured signal (col. 1, lines 1-8), said device comprising counting means including a plurality of n-nary counters (col. 2, lines 27-30),

and wherein a frequency measurement result of the measured signal is supplied from said counting means every given time interval (col. 4, lines 4-24 and Fig. 5) from which the subject-matter of claim 1 differs in gate means for supplying the measured signal to an input of said respective n-nary counters in order at given time intervals.

5.2 The objective problem to be solved by the present invention may therefore be regarded as how to provide a delay for the start of the frequency count in every counter (see as well p. 20, l. 9-16 of the description).

5.3 Document D1 itself provides an alternative solution to the same problem in providing directly a delay of a given time interval to the counter (see col. 4, l. 24-30 and delay lines 205a-d in fig. 1).

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5.4 The feature of using gate means for supplying the measured signal to an input of said respective n-nary counters is a matter of normal design procedure for frequency counters, see for example standard textbook D2. Its inclusion in the frequency counter described in document D1 would therefore be an obvious design possibility for the skilled person in order to solve the problem posed.

6. The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of **claim 2** does not involve an inventive step in the sense of **Article 56 EPC** in view of **D1**. The detailed argumentation for the missing of an inventive step is the same as under paragraph 5 of this communication.

7. The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of **claim 3** does not involve an inventive step in the sense of **Article 56 EPC** in view of **D1**.

7.1 Document D1, which is considered to represent the most relevant state of the art, discloses a device for measuring the frequency of a measured signal (col. 1, lines 1-8), comprising a counting section including a number I of n-nary counters;(col. 2, lines 27-30) a time reference circuit (control circuit 5 and counters 2a-d in Fig. 1) that outputs a time reference signal, (signals (2a)-(2d) in Fig. 5) a duration of which is t (see counting period in signal (2a) in Fig. 5), every time interval p (see data interval D.I. in Fig. 5); and wherein the frequency measurement result of the measured signal is supplied from said counting sections every time interval p. (col. 4, lines 4-24 and Fig. 5) from which the subject-matter of claim 3 **differs** in a number I of gate circuits respective outputs of which are connected to the inputs of said I n-nary counters, each of said I gate circuits having a first input that receives the measured signal, and a second input that receives the time reference signal at the time interval p;

7.2 The objective problem to be solved by the present invention may therefore be regarded as how to provide a delay for the start of the frequency count in every counter (see as well p. 20, l. 9-16 of the description).

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7.3 Document D1 itself provides an alternative solution to the same problem in providing directly a delay of a given time interval p to the counter (see col. 4, l. 24-30 and delay lines 205a-d in fig. 1).

7.4 The feature of using gate circuits respective outputs of which are connected to the inputs of said n-nary counters, each of said gate circuits having a first input that receives the measured signal, and a second input that receives the time reference signal at the time interval p is a matter of normal design procedure for frequency counters, known for example from standard textbook D2, p. 618. The use of a number of these gate circuits in the frequency counter described in document D1 would therefore be an obvious design possibility for the skilled person in order to solve the problem posed.

8. Dependent claim 4 does not contain any additional features, which make a contribution over the prior art disclosed in document D1, see col. 4, lines 24-30 (A 56 EPC).

9. It is clear from the description, especially from the stated problem and solution on pages 7, 9, 13-14 that in the polishing apparatus with end point detecting mechanism following feature is **essential** to the definition of the invention: comprising an **eddy current sensor**. Since independent **claims 5 and 6** do not contain this feature they do not meet the requirement following from **Article 84 EPC** taken in combination with **Rules 29(1) and (3) EPC** that any independent claim must contain all the technical features essential to the definition of the invention.

10. At present, the first invention is comprising 3 independent device claims and 2 independent method claims. The applicant is requested when filing an amended set of claims to comply with **Rule 29(2) EPC**. Consequently, the applicant is invited to file only **one independent claim** in each category which takes account of the above comments.

11. To meet the requirements of **Rule 27(1)(b) EPC**, the **documents D1 and D3** should be identified in the description.